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ABSTRACT

The interplay between an infant's development and its family context during the early years has been studied in a longitudinal investigation. A total of 16 normal families having 1 child between 1 and 3 years of age and a newborn child were observed monthly in unstructured situations in their homes over a period of 2 years. When the youngest child was about 5 years of age, both children in each family were given intelligence tests. Tape recorded observations were split into episodes 20 to 40 seconds in duration and scored according to categories covering different domain of family interaction. Data from 7 families were cross classified and analyzed as to general trends of changes and continuity during the 2-year period. Verbal intelligence scores of each family's two children at at preschool/school age were used as guidelines for a longitudinal follow-down approach. Four families whose children had high scores on verbal intelligence tests and four families with low scoring children were selected from the total sample. The two contrasting groups were used for exploring salient differences in family-specific socialization activities during the early years. Results of general trend analyses point to an age-specific adaptation rhythm of family dynamics during the 2-year period. Results from the study of contrasting groups point to family- and age-specific socialization patterns during the early years. (Author/RH)

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THE ARRIVAL OF A SECOND CHILD: FAMILY TASKS AND RHYTHMS OF MUTUAL ADAPTATION

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Abstract

The interplay between the infant's development and its family context during the early years has been studied in a longitudinal approach. The family was conceptualized as a problem solving group trying to integrate a new child and to find a new balance.

Sixteen normal families having one child at the age of one to three and a second child born at the beginning of the study were observed monthly in unstructured situations in their homes during a two year period. Three years later, when the second children were about five years old, both children of each family were given intelligence tests. Tape recorded observations were split up into short episodes lasting between 20 and 40 seconds each and scored according to categories covering different domains of family interaction such as family constellation, family dynamics, and socialization activities.

Data from seven families were cross classified and analyzed as to general trends of changes and continuities during the two year period according to the method of log-linear models (study 1); verbal intelligence scores of each families' two children in preschool/school age were used as guidelines for a longitudinal follow down approach: four families whose both children had high scores on verbal intelligence tests and four families with low scoring children were selected from the total sample. The two contrasting groups were used for exploring salient differences in family-specific socialization activities during the early years (study 2).

Results of general trend analyses point to an age specific adaptation rhythm of family dynamics during the two year period. Results from the study of contrasting groups point to both family- and age-specific socialization patterns during the early years.

Introduction

A family runs through several stages during its existence. In each stage, a number of tasks has to be accomplished for coping with specific problems the family is confronted with. For example, the family as a whole has to accomplish tasks such as physical maintenance of family members, reproduction and socialization of new family members, maintenance of family members' motivation to perform familial and other roles for common activities (Bennett, & Tumin, 1948). The concept of family tasks has been elaborated by researchers like Rogers (1973), Duvall (1977), and Aldous (1978) during the seventies. The life long developmental approach on the one hand, and the drawing on the developmental task concept of Robert Havighurst (1953) on the other has brought to the fore the notion of the developing family. A family is conceived of as going through a series of changes during the life cycle as the individual members have changing needs and demands during their own development. For example, the arrival of and the caretaking for children during the preschool years is described as a phase including tasks such as the successful integration and socialization of children and the spouses' transition to new responsibilities.

Family development.

The family system here is conceptualized not as a static context for the children, a kind of stage on which development takes its course before a specific piece of scenery, but as a kind of developing organism of its own. The process of development with differentiation, specification, and hierarchical integration, as it has been conceptualized by Heinz Werner (1948,1957) may be a helpful template for analyzing changes in family interaction. For example, the task of integrating a new child into an existing family may gain an additional meaning as this process spurs the development of the family as a whole.

Changes in family relationships. The problem to generate data describing

changes of family relationships has been stated by many authors (Clarke-Stewart, 1980; Schaffer, 1984; Minuchin, 1985), but to date no sufficient solution has been suggested that would provide a solid basis for the quantification of complex family interaction patterns and their possible change over time after an outstanding life event. Although a few studies have attempted to explore the specific problems after the arrival of a second child (Feldman 1974; LaPossa & LaRossa 1981) by describing the parents' crises and retrospective feelings at specific stages in the families life cycle (e.g. Olson, & McCubbin 1983), a detailed and behaviorally based depiction of changes in family relations during this time is still lacking. Thus, the observation of changes in the relational network in an existing family's everyday life after the arrival of a new member seems to be an appropriate starting point for a longitudinal empirical study.

Child and adult development. The rapid developmental changes of the infant during the early years force the existing family to an adaptation process. It includes more than the shift from the spouses' marital to the parental relationship, and more than the establishment of a new relationship with the child, as this may be the case after the first child's arrival (Belsky 1981; 1984). The change of the existing triadic family system with one child to a tetradic formation with two children involves a tremendous set of new tasks associated with the enlargement of possible dyadic and triadic relationships within the family (Kreppner, Paulsen, & Schuetze, 1982).

New family tasks. As to the arising of family tasks, the arrival of a second child not only complicates the accomplishing of the existing tasks of a one-child family, but also adds a number of new tasks demanding new modes of problem solving. These tasks are proposed to be different from those that had to be accomplished after the first child's birth. For example, as the mother is extremely occupied with the new infant, the father most likely is being more involved in caretaking

activities than before, specifically with the first child. As the second child grows, the family as a whole has to accomplish other new tasks such as the differentiation of relationships between parents and the two children, as well as the handling of sibling rivalries as they emerge during the second child's development. With two children, the extant parent - child system has to be differentiated according to a parent - child1 and another parent - child2 relationship, and both have to be hierarchically integrated into the extant relational network. The parents might begin to realize that there is another generational group, "the children", inside the family whose interests sometimes may clash with those of "the adults." Thus, the transformation of the family may also spur the adults' own development.

Family socialization and individual development.

The question how early socialization influences cognitive development has been investigated by a number of longitudinal studies. Their results suggest some relationships between contextual stimulation (as measured by the HOME scale, Bradley and Caldwell 1976, 1984) and later cognitive achievements (Cohen, & Beckwith 1979; Cohen, & Parmelee 1983; Tulkin, & Covitz, 1975). These results have been questioned as not being replicable, leading to a model of discontinuity between infancy and later intellectual abilities. In recent analyses, however, this model of discontinuity has been criticized (Bornstein, & Sigman, 1986), and more refined measures for early childhood behaviors have been demanded for the assessment of cognitive development. Taking into account more adequate measures for infant cognitive behavior like attention and perception, a continuity model becomes more likely after analyzing a number of respective studies (Lewis, & Brooks Gunn 1981; Bornstein 1984; Sigman, & Cohen, 1985;). Recent results in the attachment domain of early childhood research point into the same direction: well attached children are better functioning in school (Lamb, & Thompson, 1986; Main, Kepler, & Cassidy, 1985;

Erickson, Sroufe, & Egeland, 1985). However, these studies had in most cases only mother-child interactions as antecedent influences for later cognitive and social development. The whole family as the real context of the children's early experiences has never been under investigation.

Consequences for empirical research. Two aspects appear to be of relevance for an empirical investigation when using the concept of a developing family: First, the delineation of general changes in interaction patterns as the extant family with one child enters its enlargement process after the arrival of the second child; and second, the exploration of differential socialization activities as they might impinge on the development of the child s specific abilities and skills. The timing of the mutual adaptation process may play an important role for the actual interplay between the family's effort to find a new balnce and the new child's cognitive and social development. Thus, as age-related changes in family interaction patterns may be supportive or impending for the child's cognitive or social development, the specific rhythm of mutual adaptation between the members of the widened family perhaps can be used as a tool for exploring differential solutions of the enlargement problem. As a first step, it appeares promising to follow down longitudinally two groups of families with children differing markedly according to specific abilities (e.g. verbal IQ scores) in preschool/school age in order to explore the families particular interaction patterns during early socialization.

Two studies are presented here. The first investigation focuses on the elaboration of the general adaptation rhythm of seven families as they integrate a new family member and attempt to find new balances within a two year period, the second study, being conducted as part of a doctoral dissertation by Brunke (1986) with data from the same corpus of videotapes, illuminates a follow down approach of two groups of 4 families whose children displayed markedly different scores on intelligence tests when the children were in the preschool and school age (second

children 5 years, first children 6 - 9 years old).

To sum up, efforts have been made to establish a proper framework for the empirical investigation of changes in family interaction after the arrival of a new member and for a study of the possible impact of families' specific adaptation rhythms on later individual development. The following assumptions have been made:

-- The first two years in the life of an infant in the family are likely to be a fruitful basis for studying the rhythms of mutual adaptation within the family system.

-- The arrival of a second child generates a number of specific tasks for the other members of the family which are different from those that are created after the first child's birth.

-- Longitudinal observation of families' every day care taking routines in the natural environment appears to be a proper way for following the "natural experiment" of the enlargement process of the family after the birth of a second child.

-- A longitudinal follow down approach is taken as a tool for exploring contingencies between cognitive abilities in preschool/school children and differential rhythms of family interaction patterns during the early years.

Method

Sample and data generation.

Cases in both studies are taken from a sample of sixteen families which have been observed (videotaped) in their homes every month during a two year period after the arrival of a second child. All families had one child at the age between one and four years and a second child born at the beginning of the study. After a global description of changing interaction patterns that were found to be common in all families (Kreppner, Paulsen, & Schuetze, 1982), parts of the available video material were analyzed according to a category system that has been developed for

quantification of polyadic family interactions and socialization activities (Kreppner 1984). Five years after the beginning of the study, all families' two children were tested as to their intellectual abilities.

Study 1. The video material of seven families representing the two year period served as basis for the quantitative analysis of continuity and change in family interaction. To do this the two year period was partitioned into 7 segments (6/8 weeks, 4/5 months, 8/9 months, 12/13 months, 16/17 months, 20/21 months, and 23/24 months). Videotaped observations from 7 time segments (two single observations of 32 minutes from different occasions were combined in each segment for balancing situational effects), lasting 64 minutes each, were used as the basis for a general quantitative analysis of various aspects of family change and adaptation rhythms. Each family's 64 minutes of videotaped interaction per segment were split into short episodes lasting between 20 and 40 seconds. Thus, 160 - 180 episodes are representing one time segment for every family, yielding a total of about 1100 episodes per family over the two year period. Every episode was scored according to a number of categories covering family constellations, family dynamics, and socialization activities.

Family constellation was coded by a three digit number. The first digit indicates the number of persons present in the family, the second digit stands for the depiction of the relationship among family members (no, dyadic, triadic, tetradic relationship), and the third digit finally specifies the family members being involved, (e.g., whether the dyad is the mother with the first child or the father with the mother etc.). Family dynamics were indexed by two codes, one for the main initiatives in an episode, the other for the main target of this initiative (e.g. the mother is turning to the first child). Finally, socialization activity within the family was delineated by a code for either controlling or integrating activity.

Interrater reliabilities (Cohen's kappa) were between .80 and .99 for the constellation and dynamics scores, and between .70 and .80 for the socialization scores.

Study 2. Two groups of four families were selected from the total sample of 16. The groups consisted of families whose both children reached either high (group 1) or low (group 2) scores in a verbal part of an intelligence test (HAWIVA for the 5 years old and HAWIK-R for the older siblings) when the second children were 5 years old.

From the family socialization scorings those items were chosen for analyses which seemed to be most likely associated with the kind of global ability which is measured by the verbal IQ. The following aspects of family interaction during early childhood were included into this anlysis: "Cognitive stimulation", an activity displayed by any family member as verbal or acting instigator of a predominantly cognitive activity; "responsive behavior" as a sensitive interaction of any family member in which the intentions of the other are attended and respected; "transmisson of rules" as the informative as well as explorative introduction of physical, social or familial rules, and, finally, "communication topic: objects, language, and play" as the explicit family communication theme in an episode. For this study, three time periods were chosen in which individual development appears to be at particular critical points as to locomotoric, social, and cognitive growth: 8/9 months (period 3), 16/17 months (period 5), and 23/24 months (period 7).

Data analysis.

The statistical analysis in study 1 focused on analyzing general trends of changes in family interaction during the two year period. Frequencies of occurring family constellations were cross-tabulated over time and tested against equal distribution (Kolmogorov-Smirnov one sample test); the frequencies describing family dynamics and socialization activities were cross classified for every family

separately in four-dimensional tables (time segments: A, initiatives: I, targets: T, and socialization activity: S). The log-linear model analysis (Fienberg 1980) seemed to be appropriate for handling these categorical data sets. Frequencies of family members' dyadic interactions over time were analyzed as to differences between specific dyadic family configurations (parent - children, children - parent, child - child and parent - parent combinations) with the Kolmogorov-Smirnov two sample test. Socialization activities were included into the log-linear analyses, and frequencies were described as they occurred in specific dyadic configurations.

In study 2, the two selected groups (according to low and high verbal IQ scores of both children) were analyzed as to four different socialization and communication items. Frequencies were cross-tabulated as to the following dimensons: High versus low family groups (F), initiator in an episode such as parents, first child, second child, (I), and age of the second child (A). The resulting tables were examined with the method of log-linear analysis.

Results

Study 1.

Family constellations. Although observations of everyday interactions had not been prestructured as to the actual presence of all members in the family, constellations for all 7 families over all 7 time segments were found to center around the nuclear family with mostly 3 or 4 members present during the observations.

Insert figure 1 and 2/table 1 about here

Regarding those constellations where all 4 members were present, the most outstanding frequencies are 410, 422, and 428. These are considered separately as to their time specific course and possible changes over time. The 410 constellation, indicating that all four members are present though not interacting with one

another, happens to occur only infrequently during the first months after the new member's arrival, but increases continuously after the eighth month and remains at a fairly high level during the second year. In contrast, the other two outstanding constellatons 422 and 428 (featuring mother - child2 interactions with father and child1 either remaining single or forming another dyad) are extremely hich during the first months and find a new level in the second year. When these particular mother - child2 family constellations are compared to the respective father - child2 constellations 424 and 427, a kind of equalization in parental dealing with the second child during the second year becomes obvious. The exceptional role of the mother - child2 interaction within the family apparently comes to an end after the first year.

Insert figures 3 - 5/ table 2 about here

Dynamics and socialization. Two indices for family dynamics and one index for socialization activities were cross-tabulated according to their age-relatedness (of second child), yielding a four dimensional table for every family. These tables were analyzed according to the log-linear method and a common model for all families. AI, ITS which fitted the observed frequencies in the tables could be found. Although differing in the degree of fit, all families showed acceptable p values for this model.

Insert table 3 about here

The two term model describes two important aspects: First, the interaction term AI indicates the interplay between specific initiatives in family interaction and the age of the second child; second the triple term ITS signals an initiative - target specificity of socialization activities, independent of the second child's age.

For a more detailed analysis of 6 pairs of dyadic interactions over time, the AI term has been depicted according to the varying initiators. In addition, the

initiatives were contrasted as to differing targets. Three of these contrasts show significant differences: the mother - child1/child2 initiatives, the child2 - mother/father initiatives, and the siblings' mutual initiatives.

Insert figures 5 - 11/table 4 about here

Looking at these age-related trajectories, one can easily notice again the outstanding role of the mother-child2 interaction during the first 4-8 months. This specific relationship approaches the level of the mother-child1 interaction no sooner than with the beginning second year. The second child, of course very much aligned with the mother during the first year, shows a greater amount of interest for the father during the second year. The comparison of the mother's initiatives toward her two children reveals that she continuously exhibits more initiatives toward the second child, even after the "normalization" in the second year. Differences between the siblings' own initiatives toward each other are clearly marked by the first child's ups and downs during the first 16/17 months as compared to the second child's more continuously increasing interest in the older sibling. As to the non-significant contrasts, the father-child1/ child2 initatives disclose a much greater balance of the father's interactions with both children compared to those of the mother. The first child's initiatives toward both parents seem fairly balanced, he or she prefers the father a little bit over the mother during the first year; finally, the parent's mutual interactions display an inequality trend as the mother continuously shows more initiatives toward the father than vice versa.

Specification of family socialization. The triple term ITS is analyzed separately according to the two different socialization items involved: social control and social integration activities. Although the ITS term does not contain an age-related component, alterations over time could be of interest for further differential analyses. Thus, in addition to listing the overall frequencies for the various initiative-target dyads, the combinations were also tested against an equal

distribution over time. Clearly, again the mother - child2 dyadic interaction shows the most outstanding deviation from equal distribution in both socialization activities.

Insert table 5 about here

Turning to the overall frequencies, mothers as well as fathers show more overall social control activities toward their first than toward their second children. As results show, also the first children seem to exert control on both parents, the mother being a more preferred target than the father; the second children, too, display a considerable amount of control over both parents. Finally, the two siblings' frequencies (though relatively low) point to a dominance of child1 over child2.

As to the social integration item, both parents display higher frequencies concerning this kind of socialization activity toward the second child than toward the older sibling. Regarding the two children's own activities for integrating their parents, both show different tendencies: whereas the first child is higher in father - integration, the second child's activities appear to be targeted equally to both parents. Whereas only very low frequencies are found for the siblings' mutual interaction, the parents' integration activities towards each other are relatively high; they point to a mutual effort for maintaining this specific relationship within the family.

Study 2.

Frequencies were cross-tabulated as to the two groups of families with high versus low verbal IQ children (F), the various initiators of family interaction (I), and three age-periods of the second child (A); they were analyzed separately for four selected socialization and communication items. A common model having two terms [F AI] could be identified for all items.

Insert table 6 about here

The independent F term as a main effect indexes the general differences in the various socialization activities regarding the two family groups. In addition, the interaction term AI, known from the analyses of general trends, points to an interplay between intitiative and age-period of the second child.

Parental socialization activities. Specifications of the F, AI model for the single items show a general difference for the parents' initiatives between the two family groups in one item ("transmission of rules"), and differences as to time-specific socialization activities in the three other items.

Insert figures 12-15 about here

The parents' continuous differences as to the item "transmission of rules", with the high group showing consistently lower frequencies, point perhaps to a more liberal dealing of rule-directed interaction between parents and children in the high verbal IQ group. Age-related differences for the items "cognitive stimulation", "responsive behavior", and "communication topic: objects, language, and play" show mixed trends: Whereas parents in the high verbal IQ group tend to initiate responsive behavior and object, language, and play related communication earlier (at 8/9 months) than the low-group parents, high-group parents exhibit a lower rate of cognitive stimulation at the 8/9 months period. This last behavior is in a way contrasting the usual expectation of early intervention, but perhaps it fits to the child's own developmental rhythm. In addition, regarding parents' responding behavior, the low group parents do have high scores at 16/17 months, but are low at 8/9 months where from a social developmental point of view responsive behavior is presumed to be very important for further development (Trevarthen, & Hubley 1978).

Children s socialization activity. The differential analysis of the children s varying amount of initiatives in specific family interaction during early development could be of specific interest for exploring later differences in verbal ability. The "transmission of rules" item revealed no or only very small frequencies

for both first and second children in both groups and therefore needs no further consideration. As to the remaining three items, the second children show distinct age-related differences. Responsive behavior is being initiated more often by the high verbal IQ group as early as 8/9 months, but no differences are found during the second year. Quite the opposite trend is visible in the other two items: The high-group children, though similar to the low-group children at 8/9 months, disclose clearly increased initiatives in the "cognitive stimulation" item as well as in the "communication topic" item during the second year.

Insert figures 16 - 18 about here

Finally, also the first children have been analyzed separately as to their possible variations in family socialization. Marked and consistent differences are visible only in the communication item as high-group first children produce a higher rate of initiatives than low-group first children.

Insert figures 19 - 21 about here

Summing up results of study 2, three aspects deserve attention: First, consistently different parental behaviors concerning the use of "transmission of rules" in family socialization are found. Parents of children who later reach lower scores in verbal IQ show a higher amount of "transmission of rules" behavior between the 8/9th and the 24th month. Second, age-related differences in both parents' and children's behaviors as to three other socialization activities point to a difference in rhythm of the mutual adaptation process during early development. Third, the second children's own pace for initiating stimulating or communicative activities is different for the two groups during the second year, pointing to the possibility to trace back differences in preschool abilities to differences in young children's own activities to form and "construct" their own development.

Conclusions and discussion

General trend analysis.

As analyses of general trends in both family constellations and dynamics suggest, the family as a system appears to undergo a considerable change during the time following the arrival of a new child. New relationships are initiated and extant ones are transformed. However, changes do not occur immediately after the new member's arrival, and it takes some time until a new level of balance is reached inside the family. During the first two years, a number of specific tasks are to be accomplished in order to move the family from a triadic to a tetradic interaction unit. The mother plays an eminent role for the basic integration of the new baby into the family system during the first year; at the same time, however, the pattern of relationships between the other two family members, the first child and the father, display marked alterations, too. Thus, possible crises in extant relationships of the triadic network may be considered at least in part as necessary transitional conditions and not so much as inividual relational problems. In addition, a totally new relationship is emerging during the two year period. Between the 8/9 months and the 16/17th months increased frequencies in sibling interaction signal a growing interest of the children towards one another, a period perhaps relevant for the establishment of the sibling relationship. During the second year, especially between the 16/17th month and the 23/24th month, the parent - child as well as the children - parent relationships apparently have reached a new level of stability, as no marked changes show up in most single trajectories. Only the parents' mutual interaction is characterized by some fluctuations as the mother's initiatives toward the father show a disinct peak at 16/17 months, perhaps indicating a rapprochement phase for reaffirming the marital relationship after the stressful integration period with the second child.

Another point of the general trend analysis should be mentioned: Socialization

activities of the family's various members display a differential involvement of all. Not only the parents direct their integration and control activities towards their children, but the opposite direction of socialization is also found, especially when the first child is being regarded.

Comparing all trajectories of initiatives over time, the general change pattern of family dyadic relationships that has been found in this quantitative analysis in a way seems to fit into a three phase model as this had been proposed by Kreppner, Paulsen, and Schuetze (1982) with a first phase characterized by "fair distribution of attention" during the first 8 months, where the mother seems to be extremely occupied with the second child and where the father increases his initiatives toward the first child; "establishment of the sibling relationship" between the 9th and 16th month as the second child claims more and more rights and the first one begins to defend his or her privileges; and "generational differentiation, individualization, and hierarchical integration" as the last section of the two year period in which a new relational equilibrium is obviously reached with the consolidation of the new member in the enlarged group and a rearrangement of the marital relationship.

Differential longitudinal analyses.

The kind of follow-down approach that has been used in study 2 perhaps can be taken as a first attempt to shed more light on the possible time-specific influences of family interaction styles on the formation of the children's specific abilities and skills. Clearly the differences found in this study have to be substantiated more thoroughly in future anlyses by using the whole spectrum of age periods and items. In these case-study analyses of single items the common model with a main effect term (F) nevertheless points to possible contingencies.

Parents of low verbal IQ children seem to attach greater importance to the transmission of rules whereas parents of high verbal IQ children apparently explain

objects to their offspring in family communication more intensely than this is done by parents of low IQ children. These results appear to support the idea of a time-specific influence of family socialization on the formation of later social and cognitive skills and abilities. However, these analyses also reveal, however, that the second children s own initiatives for cognitive activities during the second year differ according to their later verbal IQ scores. This differentiation of time-specific socialization practices opens up new doors for future research. Studies could be directed more thoroughly to the interplay between "critical phases" of the infant s development and family interaction patterns which support or hinder in a specific respect at a specific time. As Wachs (1982) has put it, more research in contextual development should be conducted on questions of "how genes and environment relate to each other in influencing development and not how much of the phenotype is due to genes versus how much is due to environment".

Summing up and attempting to combine results from the two studies, one could perhaps emphasize that while regarding the development of the child in a specific family context the context itself is changing. Thus the question of how, i.e. at what critical times and to what extent the environment is impinging on development, is open for an new round of investigation in the future.

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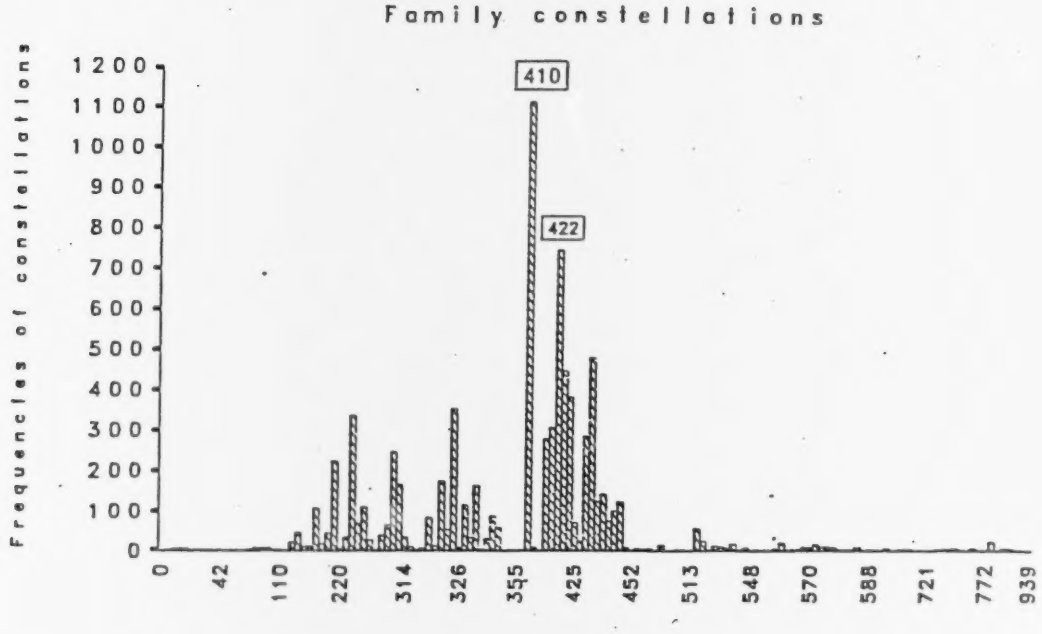
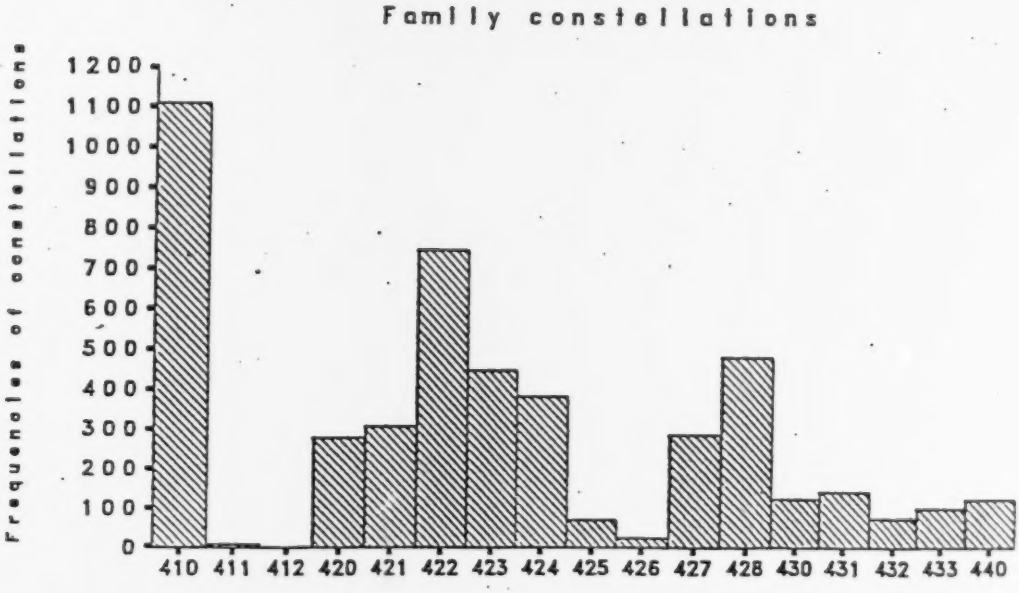
Figure 1



Note: The base axis labels are based on the range of occuring constellations

Figure 2



Note: The base axis labels are based on the range of occuring constellations

Table 1

FAMILY CONSTELLATIONS WITH ALL 4 MEMBERS PRESENT

ALL SINGLE:	410 = M, F, C1, C2
1 DYAD, 2 SINGLE:	420 = M-F, C1, C2
	421 = M-C1, F, C2
	422 = M-C2, F, C1
	423 = F-C1, M, C2
	424 = F-C2, M, C1
	425 = C1-C2, M, F
2 DYADS	426 = M-F, C1-C2
	427 = M-C1, F-C2
	428 = M-C2, F-C1
1 TRIAD, 1 SINGLE	430 = M-F-C1, C2
	431 = M-F-C2, C1
	432 = M-C1-C2, F
	433 = F-C1-C2, M
TETRAD	440 = M-F-C1-C2

Table .2 Changes of specific tetradic family constellations over time

Kolmogorov-Smirnov one sample test

Constellation	N	K-S z	p
410	1108	6.679	.000 **
422	745	10.539	.000 **
428	479	7.509	.000 **
424	382	3.036	.000 **
427	285	1.896	.002 *

alpha adjusted (Bonferroni)

Model Fit Values for Each Family
Model: AI, ITS

TABLE 3: LOG-LINEAR ANALYSIS
CHISQUARES AND PROBABILITIES FOR MODEL AI, ITS

FAMILY	DF	CHISQ. (L - R)	PROB.	CHISQ. (PEARSON)	PROB.
1	486	408.41	.9955	428.87	.9705
2	486	427.31	.9740	440.12	.9331
3	486	419.50	.9867	446.69	.8989
4	486	463.24	.7644	489.72	.4441
5	486	479.78	.5710	512.85	.1929
6	486	390.27	.9995	393.82	.9992
7	486	368.80	1.0000	386.22	.9997

A = Age of Second Child
I = Initiator (M, F, C1 or C2)
T = Target (M, F, C1 or C2)
S = Socialization Activity

Table .4 Dyadic family dynamics over time

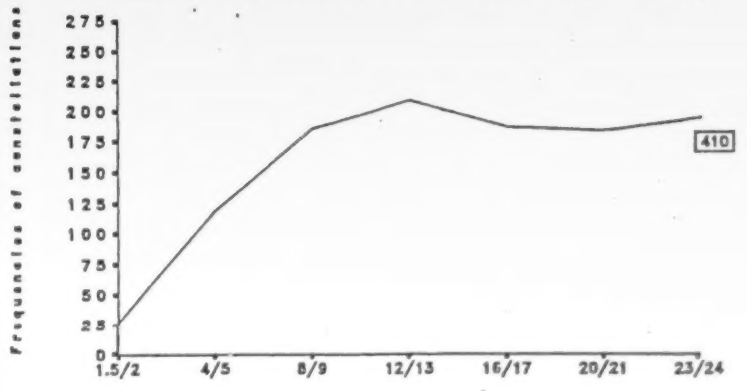
Kolmogorov-Smirnov 2 sample test

Comparison of dyads	K-S z	p
M-C1/C2	1.76	.004 *
F-C1/C2	1.47	.026 NS
C1-M/F	1.25	.086 NS
C2-M/F	1.71	.005 *
C1-C2/C2-C1	1.81	.003 *
F-M/M-F	.72	.668 NS

alpha adjusted (Bonferroni)

Figure 3

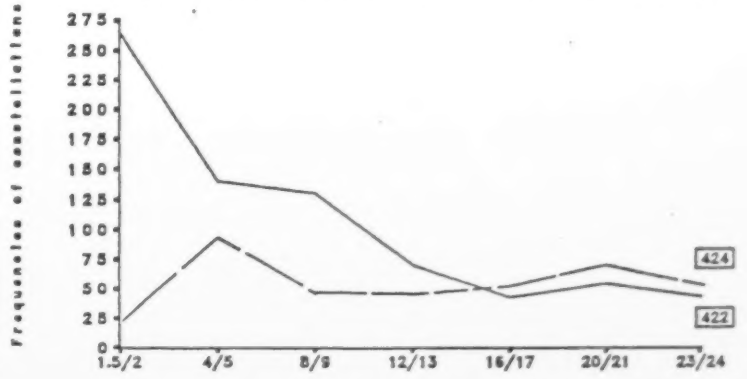
Family constellations over time (n=7)



Age of second child in months

Figure 4

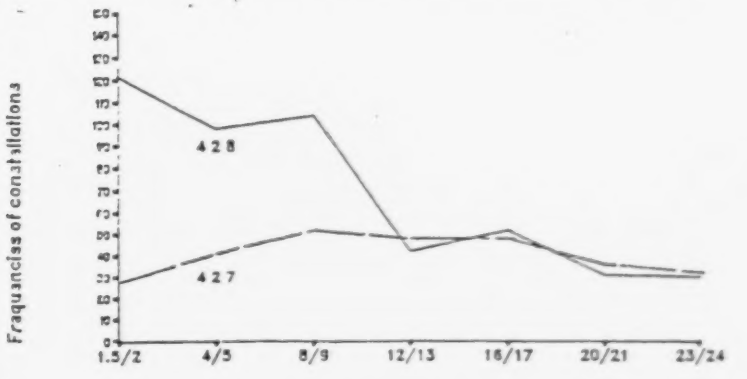
Family constellations over time (n=7)



Age of second child in months

Figure 5

Family constellations over time (n=7)



Age of second child in months

428: Mother = Child 2; Father = Child 1
427: Mother = Child 1; Father = Child 2

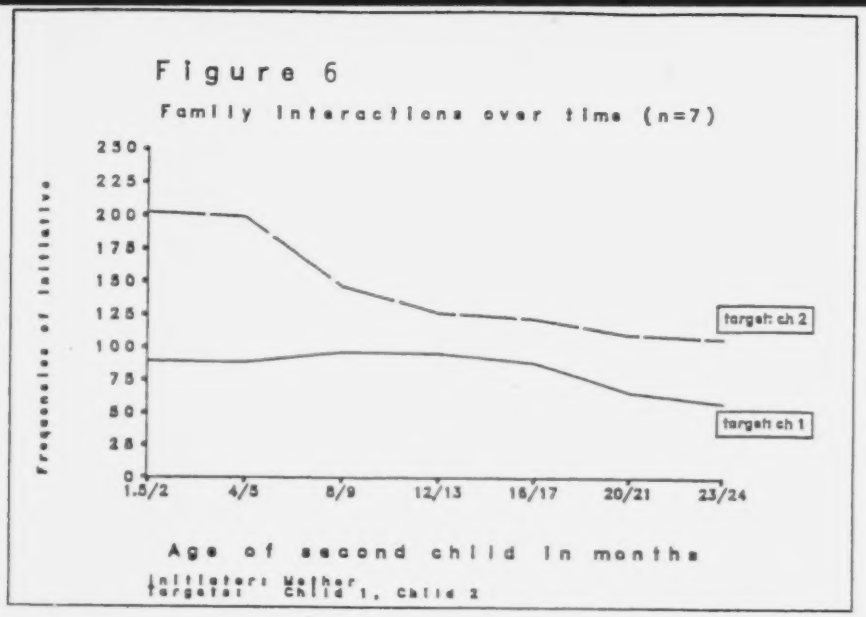


Figure 6
Family interactions over time (n=7)
Frequencies of initiative
250
225
200
175
150
125
100
75
50
25
0
1.5/2
4/5
8/9
12/13
16/17
20/21
23/24
target: ch 2
target: ch 1
Age of second child in months
Initiator: Mother
Target: Child 1, Child 2

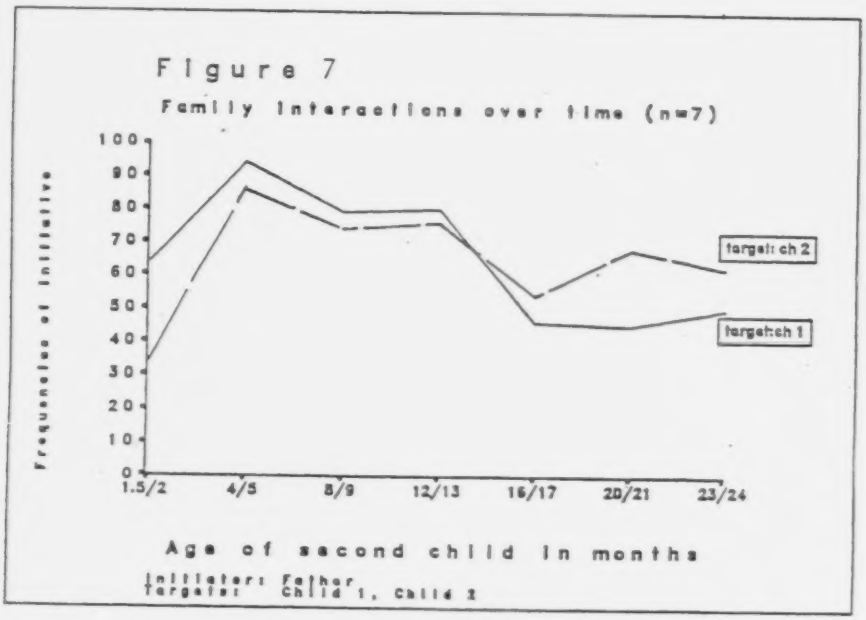


Figure 7
Family interactions over time (n=7)
Frequencies of initiative
100
90
80
70
60
50
40
30
20
10
0
1.5/2
4/5
8/9
12/13
16/17
20/21
23/24
target: ch 2
target: ch 1
Age of second child in months
Initiator: Father
Target: Child 1, Child 2

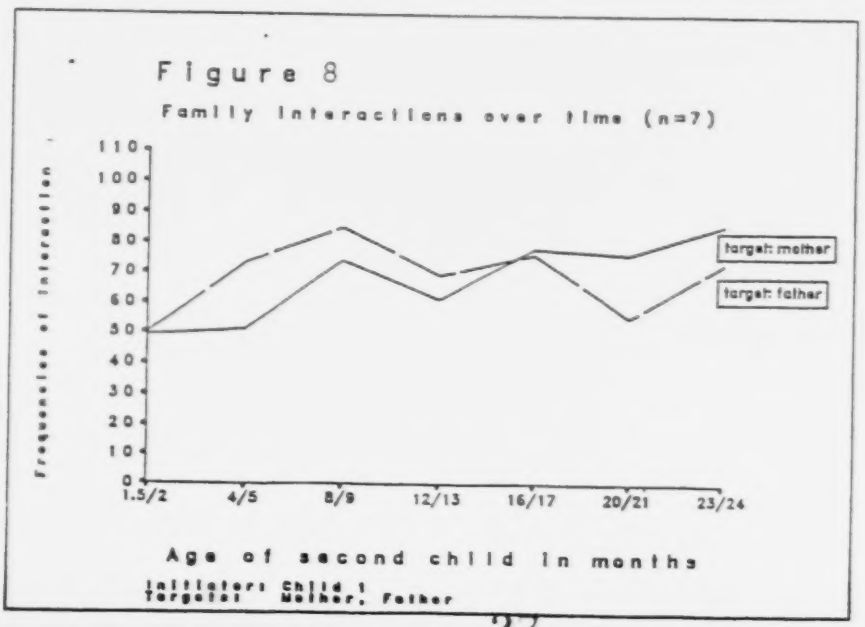
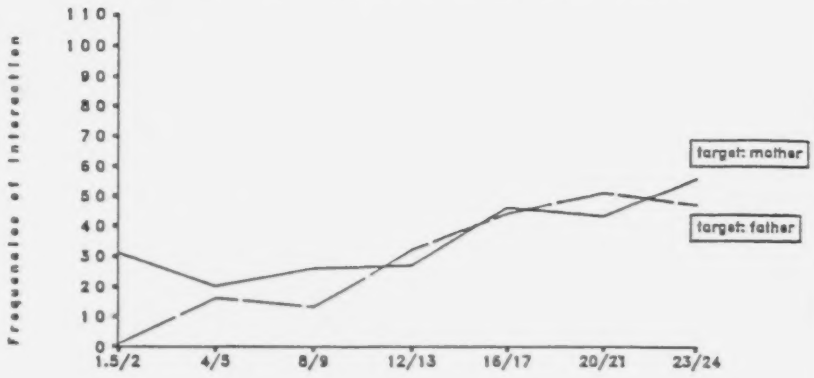


Figure 8
Family interactions over time (n=7)
Frequencies of interaction
110
100
90
80
70
60
50
40
30
20
10
0
1.5/2
4/5
8/9
12/13
16/17
20/21
23/24
target: mother
target: father
Age of second child in months
Initiator: Child 1
Target: Mother, Father

Figure 9

Family interactions over time (n=7)

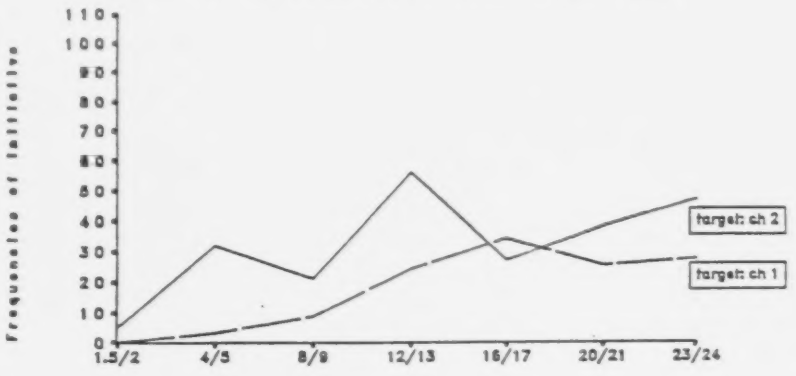


Age of second child in months

initiator: Child 2
target: Mother, Father

Figure 10

Family interactions over time (n=7)

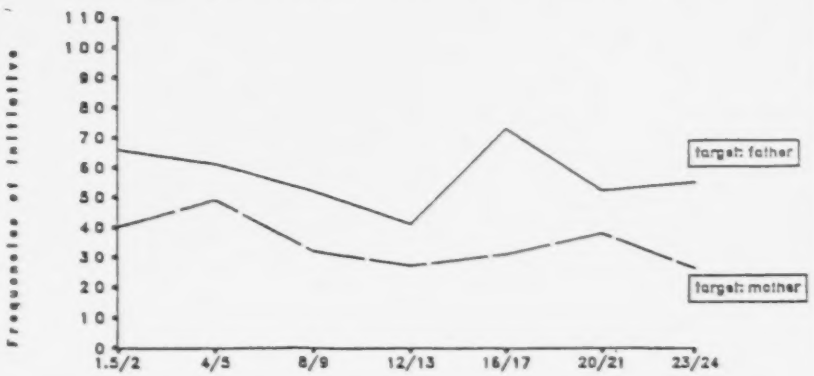


Age of second child in months

Child 1 to Child 2 and vice versa

Figure 11

Family interactions over time (n=7)



Age of second child in months

Mother to Father and vice versa

Table 5. Changes of family socialization activities over time

Kolmogorov-Smirnov one sample test
Initiative - Target - Socialization activity for all possible dyads

Soc. activity: Social Control			
Init.-Target Dyad	N of cases	K-S z	p
M - F	71	1.543	.017 NS
F - M	28	1.197	.114 NS
M - C1	240	1.743	.005 NS
M - C2	183	3.474	.000 **
F - C1	169	2.282	.000 **
F - C2	82	2.827	.000 **
C1 - M	201	2.680	.000 **
C1 - F	158	2.466	.000 **
C2 - M	100	2.300	.000 **
C2 - F	67	2.517	.000 **
C1 - C2	92	2.606	.000 **
C2 - C1	69	1.806	.003 NS

Soc. activity: Integration			
Init.-Target Dyad	N of cases	K-S z	p
M - F	212	2.587	.000 **
F - M	147	2.186	.000 **
M - C1	321	3.321	.000 **
M - C2	813	8.119	000 **
F - C1	270	3.469	.000 **
F - C2	357	3.096	.000 **
C1 - M	265	3.358	.000 **
C1 - F	313	2.261	.000 **
C2 - M	149	3.304	.000 **
C2 - F	135	4.389	.000 **
C1 - C2	89	1.919	.001 NS
C2 - C1	30	1.826	.003 NS

alpha adjusted (Bonferroni)

Table..6

Log linear analyses for four single socialization items:

Chiscuares and probabilities for model: F. AI

Item	df	Chisq (L-R)	P	Chisq (Pearson)	P
transmission of rules	11	9.28	.41	6.77	.56
responsive behavior	11	9.02	.62	8.89	.63
cognitive stimulation	11	11.60	.38	11.43	.41
communication topic	11	15.02	.13	14.06	.19

Figure 12

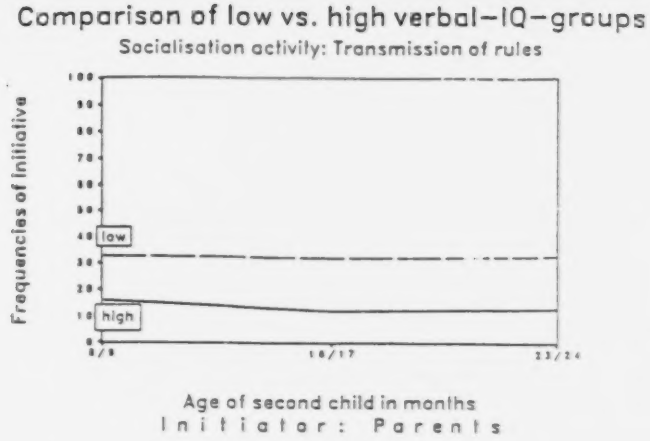


Figure 13

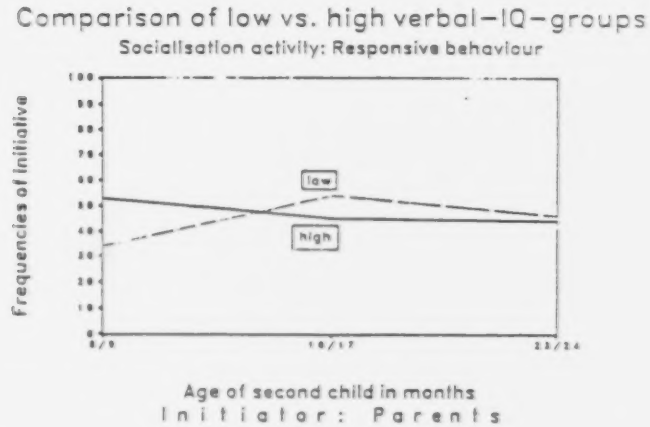


Figure 14

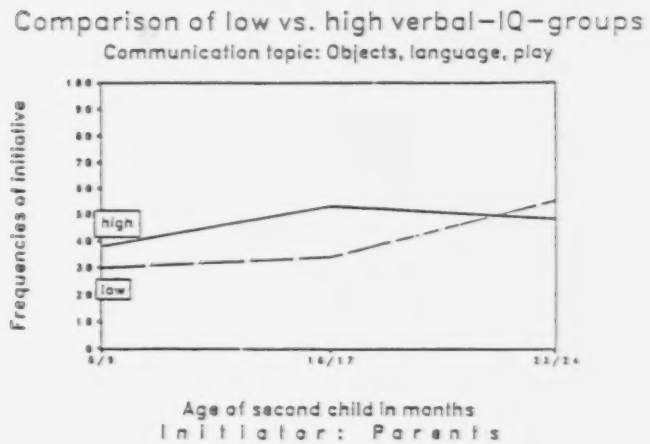


Figure 15

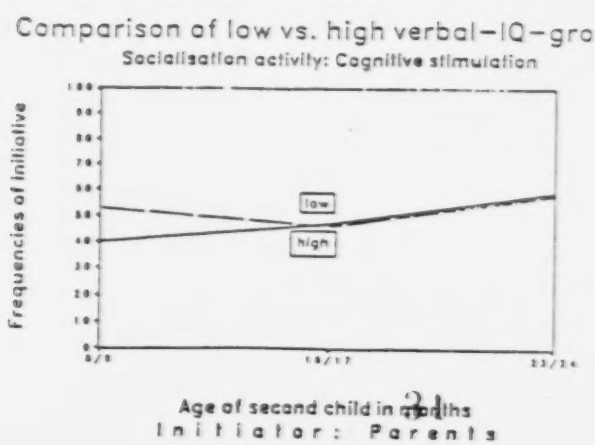
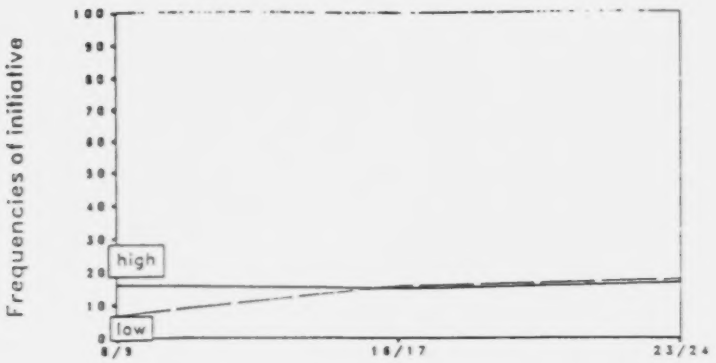


Figure 16

Comparison of low vs. high verbal-IQ-groups

Socialisation activity: Responsive behaviour



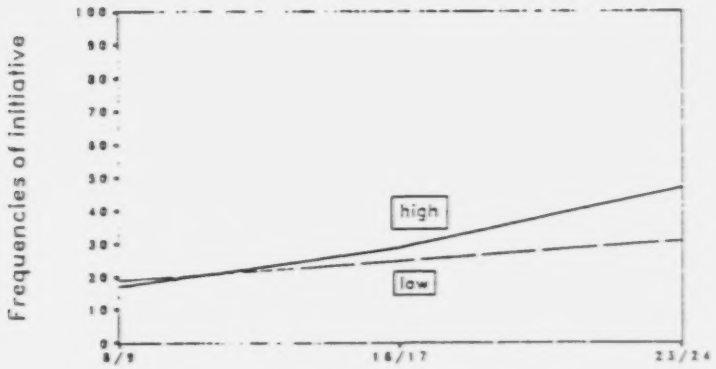
Age of second child in months

Initiator: Child 2

Figrue 17

Comparison of low vs. high verbal-IQ-groups

Socialisation activity: Cognitive stimulation



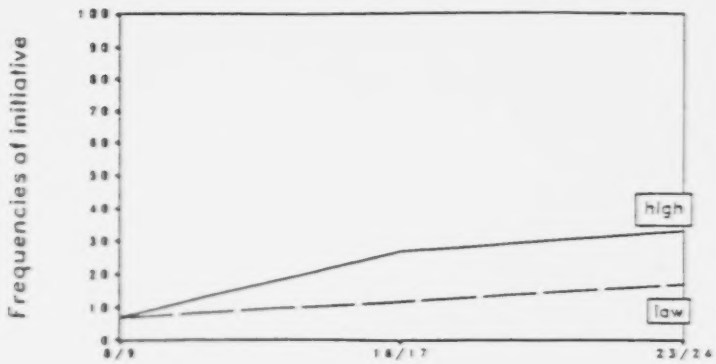
Age of second child in months

Initiator: Child 2

Figure 18

Comparison of low vs. high verbal-IQ-groups

Communication topic: Objects, language, play

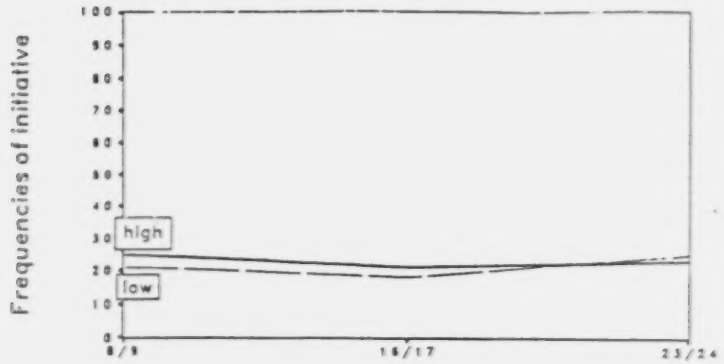


Age of second child in months

Initiator: Child 2

Figure 19 Comparison of low vs. high verbal-IQ-groups

Socialisation activity: Responsive behaviour

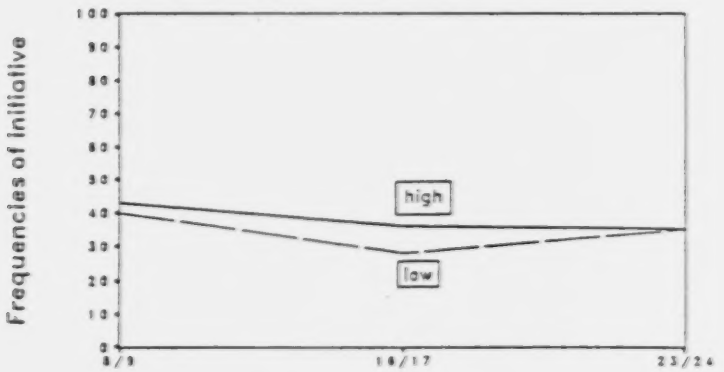


Age of second child in months

Initiator: Child 1

Figure 20 Comparison of low vs. high verbal-IQ-groups

Socialisation activity: Cognitive stimulation

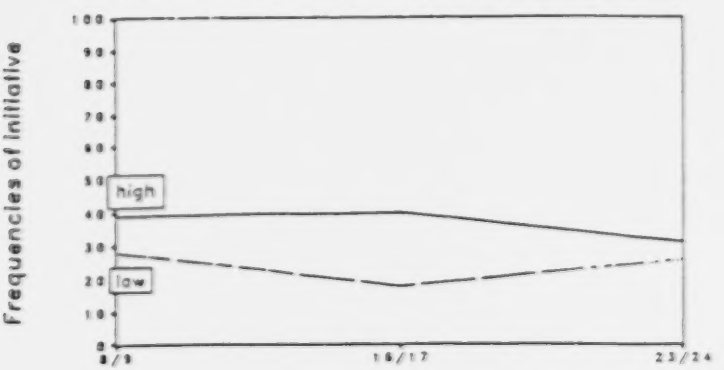


Age of second child in months

Initiator: Child 1

Figure 21 Comparison of low vs. high verbal-IQ-groups

Communication topic: Objects, language, play



Age of second child in months

Initiator: Child 1